In re application of WILLIAMS ET AL.
Serial No. 09/849,170

REMARKS

Introduction

Claims 1-22 are pending. For the reasons discussed in detail below, all of the pending claims are in condition for allowance.

Prior Art Rejections

The Office Action has rejected claims 1-8, 12-17, 21 and 22 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,188,392 to O'Connor et al ("O'Connor"). Applicants respectfully traverse these rejections. In the following, applicants provide an overview of their invention and of O'Connor and then discuss the differences.

Applicants' technique is generally directed towards providing thickness information for digital ink. To this end, applicants may use a thickness conversion component that converts movement of a pen across a surface or tilting of a pen into thickness information for digital ink data. The pen in applicants' technique may include at least one accelerometer that is used to generate either ballistic movement or ballistic pen tilting information. For example, the accelerometer generates the movement or tilt information in the form of pulses, the width of each pulse being directly related to the acceleration of the pen movements or the tilt of the pen, respectively. The thickness conversion component converts the acceleration information, with or without additional information such as coordinate information, available pressure

information, pen angle information, and vector information, into thickness information for digital ink. This thickness information may be used to generate variably thick lines, which may be useful for a variety of applications, for example, better display and improved recognition. Note that the above description is for example and informational purposes only, and should not be used to interpret the claims, which are discussed below.

O'Connor, in general, is directed toward a marking device that has a tip for contacting a surface. The marking device has a pressure sensor configured to detect when the tip of the marking device contacts the surface. Additionally, the marking device includes two acceleration sensors configured adjacent to the tip for detecting acceleration of the tip in the X and Y directions of a cartesian coordinate system. The system and technique disclosed by O'Connor is significantly different from applicants' and, furthermore, is not used to generate line thickness information. In O'Connor, the acceleration of the tip in the X and Y directions, the information from the pressure sensor and the temporal information related to sampling of the acceleration sensors are used to decompose the handwriting motion into a two-dimensional process for simplifying character recognition without the need for detecting motion or acceleration due to rotation about the X, Y, and Z directions. (O'Connor, column 4, lines 51-67.) Figure 4 of O'Connor illustrates mounting the acceleration sensors so that their normals are perpendicular to each other and are also between perpendicular to parallel to the plane of surface normal when the pen is held at a common inclination angle.

(O'Connor, column 7, lines 6-29.) This allows simple detection of acceleration in two dimensions along the writing surface for character recognition.

In contrast to the claims of the present invention, the acceleration information of O'Connor is used to simplify character recognition in two dimensions along a writing surface and is not used to generate line thickness information as claimed by applicants. Moreover, the marking device of O'Connor includes two acceleration sensors configured adjacent to the tip for detecting acceleration of the tip in the X and Y directions of a cartesian coordinate system. Applicants' technique may use only one accelerometer for generate either pen movement or pen tilting information for generating line thickness information as claimed by applicants. Furthermore, O'Connor does not disclose a conversion component that utilizes the acceleration information to generate line thickness information as claimed by applicants. Nor does O'Connor disclose any process for conversion of movement information to thickness information as disclosed and claimed by applicants. Rather, O'Connor describes using acceleration and pressure information for decomposing handwriting motion into a two-dimensional process to simplify character recognition without the need for detecting motion or acceleration due to rotation about the X, Y, and Z directions. (O'Connor, column 4, lines 51-67.) Each and every one of these differences is significant.

Turning first to independent claim 1, applicants recite the limitations of "a writing instrument that generates movement information including acceleration information from a user's handwriting" and "a conversion component that utilizes the acceleration information to generate line thickness information." Applicants'

technique may use a thickness conversion component that converts movement of a pen across a surface or tilting of a pen into thickness information for digital ink data. The pen in applicants' technique may include at least one accelerometer that is used to generate either pen movement or pen tilting information. The cited sections of O'Connor do not disclose any such limitations as alleged by the Office Action. Instead, O'Connor describes a marking device with two acceleration sensors configured adjacent to the tip for detecting acceleration of the tip in the X and Y directions of a cartesian coordinate system. The marking device includes a conversion device that merely performs analog to digital signal conversion of acceleration and pressure information for transmitting to a personal computer or data processing device. The cited sections of O'Connor do not disclose any thickness conversion component. Nowhere in O'Connor is there any description of a thickness conversion component. Nor can there be found anywhere in O'Connor any description of a process to convert movement information to thickness information as disclosed by applicants. Instead, O'Connor significantly describes using the acceleration of the tip in the X and Y directions, the information from the pressure sensor and the temporal information related to sampling of the acceleration sensors to decompose the handwriting motion into a two-dimensional process for simplifying character recognition without the need for detecting motion or acceleration due to rotation about the X, Y, and Z directions. (O'Connor, column 4, lines 51-67.)

Similarly, applicants respectfully submit that dependent claims 2-22 are not anticipated by O'Connor. Each of the dependent claims includes the

limitations of "a writing instrument that generates movement information including acceleration information from a user's handwriting" and "a conversion component that utilizes the acceleration information to generate line thickness information" as recited in independent claim 1. As discussed above, O'Connor fails to disclose these limitations. In addition to the limitations noted above, each of these dependent claims includes additional patentable elements.

For example, claim 8 recites that an "accelerometer is configured to generate tilt information." In applicants' technique, a thickness conversion component may convert information of tilting of a pen into thickness information for digital ink data. The pen in applicants' technique may include at least one accelerometer that is used to generate pen tilting information that is received by the thickness conversion component. Nowhere in O'Connor is this limitation disclosed. Instead, O'Connor describes mounting two acceleration sensors so that their normals are perpendicular to each other and are also between perpendicular to parallel to the plane of surface normal when the pen is held at a common inclination angle. (O'Connor, column 7, lines 6-29.) This allows O'Connor to perform simple detection of acceleration in two dimensions along the writing surface for character recognition.

As another example, claim 12 alternatively recites "the conversion component generates thickness information based upon wavelengths of the movement information." And claim 17 further recites "the movement information comprises tilt information." There is no mention of a conversion component for generating thickness information in O'Connor, nor is there mentioned any of

these techniques disclosed and claimed by applicants in generating thickness information. Rather, O'Connor is instead directed to overcoming the problem of providing an input device with accurate detection of the two dimensional motion of the tip of the pen on the writing surface for accurate recognition of input text or graphics, as described in the background section of O'Connor. (O'Connor, column 2, lines 42-46.)

For at least these significant reasons, applicants submit that all the claims are patentable over the prior art of record. Further, by law, in order to modify a reference to reject claimed subject matter, there must be some teaching or suggestion outside of applicants' teachings to do so. O'Connor does not have any such teachings or suggestions as to any such modification, let alone any teaching or suggestion as to how his system could be modified, or why it might be desirable to do so. In specific, the motivation described by O'Connor for providing his marking device with two acceleration sensors is to use the acceleration and pressure information for decomposing handwriting motion into a two-dimensional process to simplify character recognition without the need for detecting motion or acceleration due to rotation about the X, Y, and Z directions. (O'Connor, column 4, lines 51-67.) In accord with his stated purpose, O'Connor includes two acceleration sensors configured adjacent to the tip for detecting acceleration of the tip in the X and Y directions of a cartesian coordinate system and, further, teaches mounting the acceleration sensors so that their normals are perpendicular to each other and are also between perpendicular to parallel to the plane of surface normal when the pen is held at a common inclination angle.

(O'Connor, column 7, lines 6-29.) This allows simple detection of acceleration in two dimensions along the writing surface for character recognition. The only other way in which O'Connor could be modified to reach applicants' claimed invention is via applicants' own teachings, which is impermissible by law.

For at least these additional reasons, applicants submit that all the claims are patentable over the prior art of record. Reconsideration and withdrawal of the rejections in the Office Action is respectfully requested and early allowance of this application is earnestly solicited.

Objections

The Office Action has objected to claims 9-11 and 18-20 as being dependent upon a rejected base claim, but indicated that these claims would be allowed if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicants respectfully submit that base claim 1 and any intervening claims are not anticipated as alleged because the relied-upon sections of O'Connor were misinterpreted, as discussed above. However, applicants have rewritten claims 9 and 18 in independent form including all of the limitations of the base claim and any intervening claims. For these reasons, claims 9-11 and 18-20 are in condition for allowance, thus overcoming the objections.

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Conclusion

In view of the foregoing remarks, it is respectfully submitted that claims 1-22 of the present application are patentable over the prior art of record, and that the application is in good and proper form for allowance. A favorable action on the part of the Examiner is earnestly solicited.

If in the opinion of the Examiner a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned attorney at (425) 836-3030.

Respectfully submitted,

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CERTIFICATE OF TRANSMISSION

I hereby certify that this Amendment, along with a Facsimile Cover Sheet, Transmittal, and Petition for Extension of Time are being transmitted by facsimile to the United States Patent and Trademark Office in accordance with 37 C.F.R. 1.6(d) on the date shown below:

Date: January 14, 2004

Albert S. Michalik